

ANTHER GLANDULARITY IN THE AMERICAN MYRTINAE (MYRTACEAE)

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ABSTRACT

A survey of anther glandularity in the American Myrtinae (Myrtaceae) (83 spp.) and related Myrtaceae (42 spp.) was conducted to discover any taxonomic tendencies that might exist. Of the larger genera, *Calycolpus* typically has 9–19 glands per anther in most species; *Campomanesia*, 0–1; *Mosiera*, 1–2; and *Psidium*, 1–4. Certain species differ greatly from the standard values for their genera. Thus, anther glandularity can be taxonomically valuable at both the generic and specific levels.

RESUMEN

Se hizo un estudio de glandularidad de anteras en Myrtinae (Myrtaceae) Americanas (83 spp.) y otras mirtáceas parientes (42 spp.) a fin de descubrir tendencias taxonómicas que podrían existir. En los géneros más grandes el número típico de glándulas por antera en la mayoría de las especies es: *Calycolpus* (9–19); *Campomanesia* (0–1); *Mosiera* (1–2); and *Psidium* (1–4). Algunas especies difieren bastante de los valores típicos de sus géneros. Así es que la glandularidad de anteras puede ser de valor taxonómico a nivel genérico o específico.

The American species of the subtribe Myrtinae (Myrtaceae) comprise a group of ca. 165 species in 15 genera. An approximately equal number of genera and species of Myrtinae are found in Australasia and a single species, *Myrtus communis*, is found in the Mediterranean region. The purpose of this study was to conduct a survey of anther glandularity in American Myrtinae. Preliminary observations had indicated that anther glandularity might be of taxonomic value in this group at either the generic or specific level. Landrum (1989) used it as an aid in placing the anomalous species *Myrtus alternifolia* in *Calycolpus*, and had also found it a useful character in distinguishing *Campomanesia speciosa* from other species of that genus (Landrum 1986).

METHODS

Anthers were extracted from 299 herbarium specimens of 125 species of Myrtaceae. Most (83 spp.) belonged to American Myr-

tinae but representative species of other subtribes and Old World Myrtinae were also sampled. Anthers were soaked in bleach (5.25% sodium hypochlorite) for about 15 minutes until relatively white. They were rinsed in water or mounted directly on glass slides with water and covered with a cover slip. Sometimes a little pressure was applied to the cover slip. Slides were observed immediately at 100 \times . The glands do not change color in the short time the anthers soak in bleach, but rather remain a light yellow-brown to reddish-brown color, their contents not readily mixing with water. They stand out clearly in contrast to the whitened tissue of the rest of the anther and can usually be easily counted (Fig. 1). The tissue of the anther softens in the bleach, so care has to be taken not to leave the anthers in the bleach too long. Anthers that become too soft can easily fall apart. Five anthers were observed for each specimen and a sketch was made of a representative. Counts for the five anthers were averaged.

RESULTS

Results of this study are summarized in Table 1 and are provided in a more complete form in Appendix A. The mean number of glands per anther varies essentially continuously from zero in several species (e.g., *Pimenta racemosa*) to over 60 in *Calycolpus warscewiczianus*. In Table 1 the continuum was broken arbitrarily into five categories of mean number of glands per anther: A, 0–0.9; B, 1.0–1.9; C, 2.0–3.9; D, 4.0–9.9; E, 10.0 or more. For any particular species one to several specimens were sampled. A letter in Table 1 may represent one to a several specimens. By simple observation one can see, for instance, that species of *Calycolpus* tend to be in the D to E range, species of *Campomanesia* and *Mosiera* tend to lie in the A to B range, and species of *Psidium* are mainly in the B to D range. Certain contrasts are evident. Within *Calycolpus*, one species, *C. legrandii* stands out by having anthers with one or no glands and in *Campomanesia*, a single species is conspicuous by having several glands. The closely related genera *Acca* and *Myrrhinium* (Landrum 1986) differ widely in gland number.

In *Psidium*, most species have a moderate number of glands, but there seem to be three complexes of species that sometimes have numerous glands: *P. guineense*; *P. acutangulum* and *P. friedrichsthalianum*, closely related species of South and Central America respectively; and the Caribbean complex of *P. amplexicaule*, *P. cymosum*, and *P. dictyophyllum*.

The four species of Old World Myrtinae sampled fell within the B and D ranges. Of the 18 American Eugeniinae sampled, 16 fell in the A to B range, and only three specimens had any anthers with more than one gland. Of the 16 American Myrciinae sampled, all

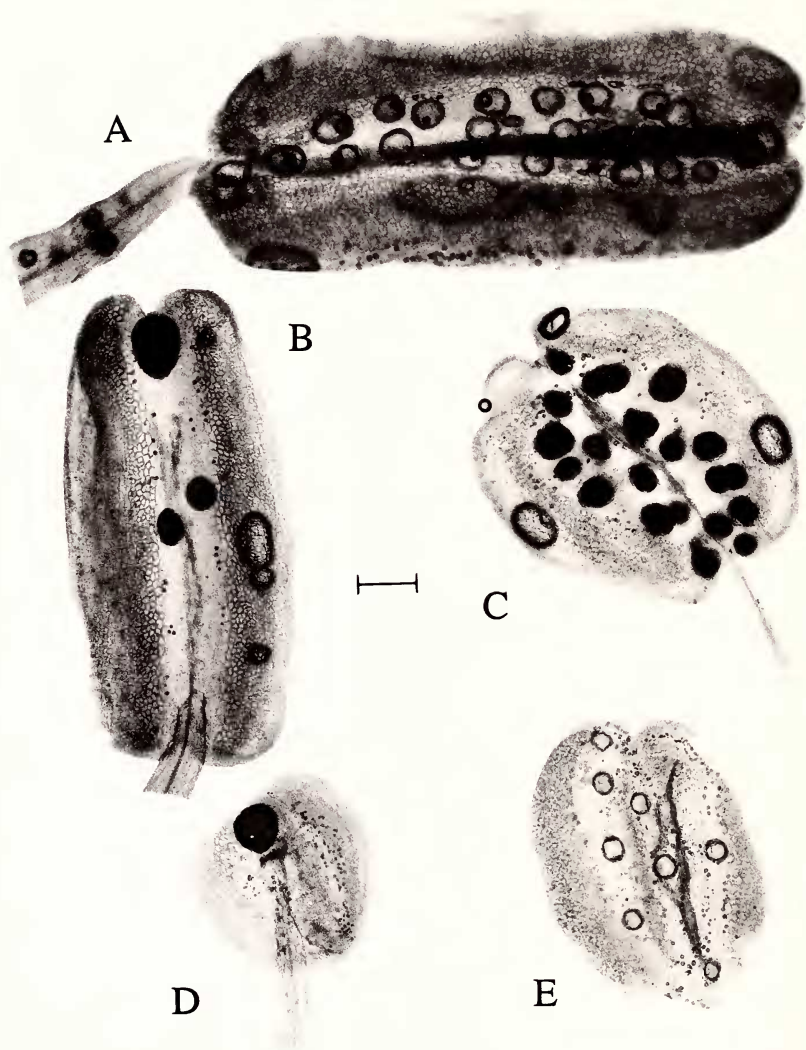


FIG. 1. Anthers of American Myrtinae. A. *Calycolpus moritzianus* (Grifo & Hahn 338A, MO). B. *Psidium guineense* (Landrum 5678, ASU). C. *Campomanesia speciosa* (Morawetz & Wallnofer 11-30985, ASU). D. *Campomanesia guaviroba* (Kummrow 2833, ASU). E. *Myrrhinium atropurpureum* (Silva 200, ASU). Bar = 0.1 mm in B, C and E and = 0.2 mm in A and D. Colorless bubbles are present in B on the right side and in C near the apex and on both sides. They are easily distinguished from glands when color is evident.

TABLE 1. SUMMARY OF ANTHER GLANDULARITY IN AMERICAN MYRTINAE. Species are classified as to the mean number of glands in the anther connectives. A, 0–0.9. B, 1.0–1.9. C, 2.0–3.9. D, 4.0–9.9. E, 10.0 or more. Each letter in the table represents at least one specimen. See appendix for more complete data.

	A	B	C	D	E
<i>Acca macrostema</i>	A				
<i>Acca sellowiana</i>	A	B			
<i>Amomyrtella guili</i>	A				
<i>Amomyrtus luma</i>	A				
<i>Amomyrtus meli</i>	A				
<i>Blepharocalyx cruckshanksii</i>		B			
<i>Blepharocalyx salicifolius</i>		B			
<i>Calycolpus alternifolius</i>			C	D	E
<i>Calycolpus bolivarensis</i>				D	
<i>Calycolpus calophyllus</i>					E
<i>Calycolpus goetheanus</i>					E
<i>Calycolpus legrandii</i>	A				
<i>Calycolpus moritzianus</i>					E
<i>Calycolpus revolutus</i>				D	E
<i>Calycolpus surinamensis</i>					E
<i>Calycolpus warszewiczianus</i>					E
<i>Campomanesia adamantium</i>	A				
<i>Campomanesia aurea</i>		B			
<i>Campomanesia espiritosantensis</i>		B			
<i>Campomanesia eugenoides</i>		B			
<i>Campomanesia grandiflora</i>		B			
<i>Campomanesia guaviroba</i>		B			
<i>Campomanesia guazumaefolia</i>		B			
<i>Campomanesia laurifolia</i>	A				
<i>Campomanesia neriiflora</i>		B			
<i>Campomanesia pubescens</i>	A				
<i>Campomanesia sessiliflora</i>		B			
<i>Campomanesia speciosa</i>					E
<i>Campomanesia velutina</i>	A				
<i>Campomanesia viatoris</i>	A				
<i>Campomanesia xanthocarpa</i>	A	B			
<i>Chamguava gentlei</i>		B	C	D	
<i>Chamguava schippii</i>	A				
<i>Legrandia concinna</i>	A				
<i>Mosiera bullata</i>		B			
<i>Mosiera contrerasii</i>		B			
<i>Mosiera ehrenbergii</i>	A		C		
<i>Mosiera longipes</i>		B			
<i>Mosiera moaensis</i>		B			
<i>Moseira ophiticola</i>		B			
" <i>Psidium</i> " <i>saxicola</i>		B			
" <i>Eugenia</i> " <i>xerophytica</i>		B			
<i>Myrrhinium atropurpureum</i>					E
<i>Myrteola acerosa</i>		B			
<i>Myrteola nummularia</i>		B			
<i>Myrteola phylicoides</i>		B			
<i>Pimenta dioica</i>		B			
<i>Pimenta pseudocaryophyllus</i>		B			
<i>Pimenta racemosa</i>	A				

TABLE 1. CONTINUED

	A	B	C	D	E
<i>Psidium acutangulum</i>	A	B	C		E
<i>Psidium amplexicaule</i>			C	D	E
<i>Psidium appendiculatum</i>	A				
<i>Psidium arayan</i>		B			
<i>Psidium australe</i>		B			
<i>Psidium cattleianum</i>		B			
<i>Psidium cinereum</i>		B	C		
<i>Psidium cuneatum</i>		B			
<i>Psidium cymosum</i>					E
<i>Psidium densicomum</i>		B	C		
<i>Psidium dictyophyllum</i>				D	
<i>Psidium firmum</i>		B			
<i>Psidium friedrichsthalianum</i>		B		D	E
<i>Psidium guajava</i>		B	C	D	
<i>Psidium guineense</i>		B	C	D	E
<i>Psidium kennedyanum</i>		B			
<i>Psidium laruotleanum</i>		B	C		
<i>Psidium longipetiolatum</i>		B	C		
<i>Psidium luridum</i>	A	B			
<i>Psidium maribense</i>		B	C		
<i>Psidium missionum</i>			C	D	
<i>Psidium montanum</i>			C	D	
<i>Psidium multiflorum</i>			C		
<i>Psidium myrsinthes</i>			C	D	
<i>Psidium persoonii</i>		B	C	D	
<i>Psidium riparium</i>		B	C		
<i>Psidium rufum</i>		B		D	
<i>Psidium salutare</i>		B	C		
<i>Psidium sartorianum</i>		B	C		
<i>Psidium spatulatum</i>		B			
<i>Psidium striatulum</i>		B	C		
<i>Ugni candollei</i>		B	C	D	
<i>Ugni molinae</i>	A				
<i>Ugni myricoides</i>	A	B	C		

fell in the A to B range and none had more than one gland per anther. Larger samples of these enormous subtribes of hundreds of species will have to be made before any conclusions can be drawn, but the small sample in this study seems to indicate that highly glandular anthers may be a rarity in American Eugeniinae and Myrciinae.

Just as a mean number of glands per specimen was calculated, a mean for each species in the four principal genera of American Myrtinae was also calculated. The generic ranges of these species means are as follows: *Campomanesia*, 0–1.1, excluding *C. speciosa* with 20.9; *Mosiera*, 1–1.8; *Calycolpus*, 9.3–18.9, excluding *Calycolpus legrandii* with 0.2 and *Calycolpus warscewiczianus* with 65.4; and *Psidium*, with 1–4 in most species, but with 0 in *Psidium*

appendiculatum, and a few species with means exceeding 4, viz., *P. montanum* (5.5), *P. amplexicaule* (5.7), *P. dycophyllum* (7.2), *P. cymosum* (11.2), *P. friedrichsthalianum* (11.6), and *P. guineense* (13.2).

DISCUSSION

To our knowledge, anther glandularity has never been used taxonomically in the Myrtaceae before except for the studies by Landrum cited above. With this survey we have found that it can be an important character at the generic and specific level. Additional surveys in the family should prove interesting.

Studies of anther glandularity have the advantage of being inexpensive to conduct and cause little damage to herbarium specimens, which normally have numerous anthers in flowering specimens. A survey could easily be included as a part of monographic studies.

What is the purpose of glands in anthers? Three potential answers occur to us. 1) the glands may provide a floral aroma; 2) they may be a protection against insects that eat anthers; or 3) their contents may be a food source for insect visitors as has been hypothesized for *Thryptomene calycina* (Lindl.) Stapf (Myrtaceae) by Beardsell et al. (1989) and for *Prosopis juliflora* (Sw.) DC. (Leguminosae) by Chaudhry and Vijayaraghavan (1992). Studies of insects visiting flowers of *Campomanesia* and *Calycolpus* might provide answers, because these genera differ markedly in anther glandularity. *Psidium guineense*, a widespread and variable species might also be of interest, because it varies more in anther glandularity than any other in the genus.

ACKNOWLEDGMENTS

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APPENDIX A

Each specimen is identified by collector, collection number, and herbarium. The highest and lowest of five counts are given first (if these are the same, only a single number is given), followed by the average of five counts. Thus, "1, 1.0" means all anthers had a single gland; "0-1, 0.8" means that anthers had zero to 1 gland and that the mean number for the specimen was 0.8.

AMERICAN MYRTINAE

Acca macrostema (Ruiz & Pavón ex G. Don) McVaugh: Smith & Buddensiek 10860 (ASU), 1, 1.0; Valencia 1627 (ASU), 1, 1.0.

Acca sellowiana (Berg) Burret: Lehto 5942b (ASU), 1, 1.0; Viana et al. 8218 (ASU), 1, 1.0; Wasum et al. 4757 (ASU), 0-1, 0.8.

Amomyrtella guili (Sprengel) Kausel: Legname & Cuezco 9640 (US), 0-1, 0.2; Solomon 11018 (CAS), 0-1, 0.6.

Amomyrtus luma (Molina) Legrand & Kausel: Landrum 7606 (ASU), 0-1, 0.2; Landrum 8099 (ASU), 0-1, 0.2; Landrum 8157 (ASU), 0, 0.0.

Amomyrtus meli (Philippi) Legrand & Kausel: Landrum 8098 (ASU), 0, 0.0.

Blepharocalyx cruckshanksii (Hook. & Arn.) Niedenzu: Gardner & Page 4982 (ASU), 1, 1.0; Landrum 5861 (ASU), 1, 1.0; Landrum 5873 (ASU), 1, 1.0.

Blepharocalyx salicifolius (Kunth) Berg: Hatschbach 28095 (ASU), 1, 1.0; Hatschbach 53600 (ASU), 1, 1.0; Zardini 7806 (ASU), 1, 1.0.

Calycolpus alternifolius (Gleason) Landrum: Do Amaral 1516 (ASU), 6-9, 7.4; Holst 3748 (ASU), 7-11, 9.0; Huber et al. 10206 (ASU), 6-9, 8.4; Maguire & Politi 27521 (MICH), 0-4, 2.0; Steyermark & Wurdack 1200 (F), 14-22, 18.4; Steyermark & Wurdack 1200 (MICH), 21-26, 23.2.

Calycolpus bolivarensis Landrum: Fernández 3068 (ASU), 8-11, 9.8.

Calycolpus calophyllus (Kunth) Berg: Maguire & Wurdack 35587 (MICH), 17-20, 18.2; Maguire et al. 36475 (NY), 11-20, 15.6; Prance et al. 30058 (ASU), 15-26, 20.0.

Calycolpus goetheanus (DC.) Berg: Holst 3029 (ASU), 16-19, 17.0; Huber 9312 (NY), 14-20, 17.0; Philcox et al. 7429 (NY), 10-13, 11.4.

Calycolpus legrandii Mattos: Amorim et al. 1513 (ASU), 0-1, 0.2; Plowman 12777 (NY), 0-1, 0.2.

Calycolpus moritzianus (Berg) Burret: Aymard 1027 (MO), 17-26, 19.8; Grifo & Hahn 338A (MO), 10-29, 18.2; Zaruchi & Betancur 6422 (ASU), 12-20, 18.6.

Calycolpus revolutus (Schauer) Berg: B. W. 4197 (US), 4-7, 5.8; Cowan 38859 (MICH), 11-15, 12.8; Maas & Westra 3519 (MICH), 6-14, 9.4.

Calycolpus surinamensis McVaugh: Irwin et al. 55186 (US), 12-19, 13.8; Rosa 231 (MICH), 20-27, 23.6.

Calycolpus warszewiczianus Berg: de Nevers et al. 7710 (ASU), 34-50, 40.6; Dwyer et al. 4705 (MICH), 62-84, 75.2; Croat 7682 (F), 62-72, 68.4; Croat 7682 (NY), 63-85, 77.2.

Campomanesia adamantium (Cambess.) Berg: Gottsberger & Gottsberger 22-25990 (ASU), 0, 0.0; Gottsberger & Gottsberger 22-25990 (ASU), 0, 0.0.

Campomanesia aurea Berg: Wasum et al. 4946 (ASU), 1, 1.0.

Campomanesia espirosantensis Landrum: Folli 301 (ASU), 1, 1.0.

Campomanesia eugenoides (Cambess.) Legrand: Hatschbach & Hatschbach 54629 (ASU), 1, 1.0.

Campomanesia grandiflora (Aublet) Sagot: Acevedo 3489 (ASU), 1, 1.0; Silva 1450 (ASU), 1, 1.0.

Campomanesia guaviroba (DC.) Kiaerskov: Kummrow 2833 (ASU), 1, 1.0; Poligues 28 (ASU), 1-2, 1.4; Silva 380 (ASU), 1, 1.0.

Campomanesia guazumifolia (Cambess.) Berg: Gentry et al. 59409A (ASU), 1, 1.0; Vami & Cáceres 675 (ASU), 1, 1.0; Zardini & Velázquez 15158 (ASU), 1, 1.0.

Campomanesia laurifolia Gardner: Hatschbach 48785 (ASU), 0, 0.0.

- Campomanesia neriiflora* (Berg) Niedenzu: *Hatschbach* 49843 (ASU), 1, 1.0.
Campomanesia pubescens (DC.) Berg: *Gentry et al.* 59272 (ASU), 0, 0.0; *Gottsberger & Gottsberger* 15-141090 (ASU), 0, 0.0; *Gottsberger & Gottsberger* 32-41090 (ASU), 0, 0.0.
Campomanesia sessiliflora (Berg) Mattos: *Hatschbach* 48473 (ASU), 1, 1.0; *Hatschbach & Hatschbach* 52621 (ASU), 1-2, 1.4; *Pott* 5698 (ASU), 1, 1.0.
Campomanesia speciosa (Diels) McVaugh: *Foster* 11330 (ASU), 16-24, 20.2; *Morawetz & Wallnofer* 11-30985 (ASU), 20-23, 21.6.
Campomanesia velutina (Cambess.) Berg: *Gottsberger & Gottsberger* 11-24990 (ASU), 0, 0.0; *Gottsberger & Gottsberger* 12-25990 (ASU), 0, 0.0; *Gottsberger & Gottsberger* 14-24990 (ASU), 0, 0.0.
Campomanesia viatoris Landrum: *Amorim et al.* 1500 (ASU), 0, 0.0.
Campomanesia xanthocarpa Berg: *Hatschbach* 52388 (ASU), 1, 1.0; *Jaster* 232 (ASU), 0, 0.0; *Kummrow* 3084 (ASU), 1, 1.0.
Chamguava gentlei (Lundell) Landrum: *Contreras* 10882 (ASU), 3-5, 3.6; *Gentle* 8552 (ASU), 1-2, 1.6; *Landrum* 6538 (ASU), 7-11, 8.4.
Chamguava schippii (Standley) Landrum: *Gentle* 8354 (ASU), 0, 0.0.
Legrandia concinna (Philippi) Kausel: *Landrum* 7628 (ASU), 0, 0.0.
Mosiera bullata (Britton & Wilson) Bisse: *Britton & Cowell* 13328 (F), 1, 1.0; *Britton et al.* 13246 (F), 1, 1.0.
Mosiera contrerasii (Lundell) Landrum: *Durán* 990 (MO), 1, 1.0.
Mosiera ehrenbergii (Berg) Landrum: *Johnston et al.* 11161 (NY), 0-1, 0.8; *Purpus* 5211 (UC), 2-3, 2.8.
Mosiera longipes (Berg) Small: *Curtis No. E* (GH), 1, 1.0; *Killip* 43241 (US), 1, 1.0; *Proctor* 9018 (GH), 1, 1.0.
Mosiera moensis (Britton & Wilson) Bisse: *Webster* 3795 (MICH), 1, 1.0.
Mosiera ophiticola (Britton & Wilson) Bisse: *Acuña* 12609 (NY), 1, 1.0; *Howard* 6003 (NY), 1, 1.0; *León et al.* 20240 (NY), 1, 1.0.

The following two species apparently belong to *Mosiera* but have not yet been transferred.

- Psidium saxicola* Britton & Wilson: *Clemente* 5340 (NY), 1, 1.0.
Eugenia xerophytica Britton: *Miller et al.* 6493 (ASU), 1, 1.0.
Myrrhinium atropurpureum Schott: *Kummrow* 2792 (ASU), 8-15, 11.4; *Silva* 200 (ASU), 18-23, 20.6; *Wasum & Brinker* 6265 (ASU), 20-26, 23.2.
Myrteola acerosa (Berg) Burret: *Ferreira & Acleto* 15299 (ASU), 1, 1.0.
Myrteola nummularia (Poirot) Berg: *Clemants et al.* 2245 (ASU), 1, 1.0.
Myrteola phyllicoides (Benth.) Landrum: *Dillon et al.* 6442 (ASU), 1, 1.0; *Mostacero et al.* 1147 (ASU), 1, 1.0; *Stein* 2497 (ASU), 1, 1.0; *van der Werff & Palacios* 9455 (ASU), 1, 1.0.
Pimenta dioica (L.) Merr.: *Balick* 3135 (ASU), 1, 1.0; *Ihrig & Staples* 609 (ASU), 1, 1.0; *Martínez* 11774 (ASU), 1, 1.0.
Pimenta pseudocaryophyllus (Gomes) Landrum: *Poliguesi* 18 (ASU), 1, 1.0.
Pimenta racemosa (Mill.) J. Moore: *Ihrig & Staples* 608 (ASU), 0, 0.0; *Lau* 2416 (ASU), 0, 0.0.
Psidium acutangulum DC.: *Froes* 1927 (MICH), 1, 1.0; *Irwin et al.* 55388 (MICH), 1, 1.0; *Krukoff* 1089 (NY), 1-3, 2.0; *Prance & Silva* 58834 (MICH), 3-4, 3.8; *Prance et al.* 5917 (MICH), 0-1, 0.2; *Prance et al.* 14133 (MICH), 2-4, 3.6; *Prance et al.* 14133 (NY), 2-5, 3.6; *Revilla & Carrillo* 1503 (MICH), 10-14, 12.0; *Vázquez & Jaramillo* 9283 (ASU), 1, 1.0.
Psidium amplexicaule Pers.: *Ekman* 18861 (NY), 3-5, 4.0; *Fishlock* 94 (NY), 7-15, 10.0; *Smith* 10574 (MICH), 4-6, 5.0; *Smith* 10574 (NY), 3-5, 3.6.
Psidium appendiculatum Kiaerskov: *Facultad de Ciencias Forestales s.n.* (NY), 0, 0.0.
Psidium arayan (Kunth) Burret: *Luteyn & Callejas* 11782 (ASU), 1, 1.0.

Psidium australe Cambess.: Hatschbach 50322 (ASU), 1, 1.0; Hatschbach & Hatschbach 55798 (ASU), 1, 1.0; Silva 739 (ASU), 1, 1.0.

Psidium cattleianum Sabine: Krapovickas & Cristóbal 43513 (ASU), 1, 1.0; Rosato & Alii 4861 (ASU), 1, 1.0.

Psidium cinereum Martius: Harley 26964 (ASU), 2-3, 2.8; Hatschbach 27710 (ASU), 2-3, 2.2; Hatschbach & Hatschbach 55874 (ASU), 1-2, 1.8; Ribas 199 (ASU), 2-3, 2.2.

Psidium cuneatum Cambess.: Carnevali 4947 (ASU), 1-3, 2.0; Krapovickas & Cristóbal 44444 (ASU), 1, 1.0; Landrum 5717 (ASU), 1-3, 1.6.

Psidium cymosum Urban: Alain 1194 (NY), 10-13, 11.2.

Psidium densicomum DC.: Ayala 310 (ASU), 1-2, 1.2; Cid 4144 (ASU), 0-5, 2.0; Gentry & Perry 78002 (ASU), 2-4, 3.0.

Psidium dictyophyllum Urban & Ekman: Zanon et al. 33501 (ASU), 6-9, 7.2.

Psidium firmum Berg: Irwin & Soderstrom 5129 (CAS), 1, 1.0.

Psidium friedrichsthalianum (Berg) Niedenzu: Grijalva & Grijalva 1777 (MO), 11-20, 15.6; Guzmán 1804 (MO), 15-18, 17.0; Heyde & Lux 2984 (MO), 8-13, 10.2; Landrum 6555 (ASU), 12-22, 15.6; Marshall & Neill 7093 (MO), 8-11, 9.8; Matuda 18733 (CAS), 12-15, 13.6; Schmid 1972-8 (MICH), 13-18, 15.2; Skutch 3989 (MO), 4-8, 5.8; Woronow & Juzepczuk 4865 (MO), 1-2, 1.8.

Psidium guajava L.: Arvigo 239 (ASU), 7-10, 8.4; Boege 475 (CAS), 1-2, 1.2; Delgado 150 (CAS), 2-4, 2.4; Etienae s.n. (CAS), 2-3, 2.2; Hatschbach & Hatschbach 52449 (ASU), 4-5, 4.4; Hinton 5637 (ASU), 2-4, 2.8; Howell 8457 (CAS), 1-2, 1.2; Landrum 5677 (ASU), 3-4, 3.4; Landrum 5681 (ASU), 1-3, 2.0; Landrum 5683 (ASU), 3-4, 3.2; Landrum 5684 (ASU), 2-5, 3.5; Landrum 5689 (ASU), 1-7, 3.6; Landrum 5690 (ASU), 3-4, 3.4; Landrum 5742 (ASU), 2-3, 2.6; López 1164 (CAS), 2-4, 2.8; Nelson & Nelson 5180 (DS), 1, 1.0; Pipoli 9058 (ASU), 5-7, 5.8; Pipoli 9096 (ASU), 3-6, 4.6; Robertson 12 (DS), 4-7, 6.0; Skog 1518 (CAS), 4-6, 4.8; Torres 201 (CAS), 3-4, 3.4.

Psidium guineense Sw.: Allen 1007 (MICH), 6-11, 9.0; Bang 287 (CAS), 5-10, 7.0; Bang 2831 (NY), 3-7, 4.8; Brother Paul 465 (MICH), 24-43, 34.4; Harley 26590 (ASU), 2-3, 2.2; Hatschbach 30415 (ASU), 3-6, 4.0; Hatschbach 54720 (ASU), 34-52, 46.0; Irwin et al. 21204 (MICH), 40-55, 46.6; Jansen-Jacobs 89 (ASU), 15-25, 18.6; King 593 (MICH), 6-12, 9.4; Landrum 5678 (ASU), 4-7, 5.8; Landrum 5679 (ASU), 4-7, 6.0; Landrum 5680 (ASU), 5-9, 7.0; Landrum 5708 (ASU), 5-6, 5.8; Landrum 7865 (ASU), 8-9, 8.4; Longhi et al. SPF34954 CFCR 5894 (ASU), 1-2, 1.0; Maas & Maas 500 (MICH), 5-12, 9.0; Maguire & Maguire 40214 (MICH), 10-14, 12.2; Montes 14792 (CAS), 0-5, 2.2; Ribeiro 1489 (CAS), 3-5, 4.0; Tressens et al. 3470 (ASU), 2-4, 3.4; Witsberger 847 (MICH), 12-23, 18.0.

Psidium guajava × *guineense*: Landrum 5682 (ASU), 3-4, 3.4; Landrum 5686 (ASU), 3-9, 6.4; Landrum 5695 (ASU), 4-9, 7.0.

Psidium kennedyanum Morong: Hatschbach & Hatschbach 52495 (ASU), 1, 1.0; Zardini & Velázquez 19804 (ASU), 1-2, 1.2.

Psidium laruotteanum Cambess.: Gottsberger & Gottsberger 11-141090 (ASU), 3-4, 3.4; Harley 26608 (ASU), 1, 1.0; Hatschbach & Hatschbach 53638 (ASU), 1, 1.0.

Psidium longipetiolatum Legrand: Hatschbach 15250 (NY), 2-4, 3.0. Hatschbach 15289 (NY), 1, 1.0; Kuniyoshi 4722 (ASU), 1, 1.0.

Psidium luridum (Sprengel) Burret: Ekman 2048 (MICH), 0-1, 0.6; Ekman 2048 (NY), 0-1, 0.4; Hatschbach 54810 (ASU), 0-1, 0.2; Rosengurt b-4183 (NY), 1, 1.0. Zardini 7247 (ASU), 1-3, 1.8.

Psidium maribense DC.: Davidse & González 13083 (MO), 1-5, 3.2; Davidse & González 14065 (MO), 1, 1.0; Davidse & González 14709 (MO), 1-4, 3.2.

Psidium missionum Legrand: Krapovickas & Cristóbal 44607 (ASU), 3-4, 3.4; Landrum 5735 (ASU), 3-5, 4.0.

Psidium montanum Sw.: Harris 3183 (NY), 3-4, 3.6; Proctor 26438 (MICH), 6-10, 7.8; Proctor 32738 (NY), 3-7, 5.0.

Psidium multiflorum Cambess.: *Gottsberger & Gottsberger 11-27990* (ASU), 2–3, 2.4; *Hatschbach 43388* (ASU), 2–3, 2.6.

Psidium myrsinthes DC.: *Irwin et al. 9132* (MICH), 2–3, 2.6; *Irwin et al. 9132* (NY), 4–6, 5.2; *Irwin et al. 10203* (MICH), 2–4, 2.6; *Maguire et al. 57100* (MICH), 3, 3.0.

Psidium persoonii McVaugh: *Cid et al. 746* (CAS), 1–2, 1.6; *De Granville et al. 9635* (ASU), 3–6, 4.2; *van Donselaar 3731* (MICH), 1–4, 3.0.

Psidium riparium Martius ex DC.: *Macedo 4059* (MO), 2–5, 3.2; *Silva 2715* (MO), 1, 1.0; *Silva 2715* (NY), 1, 1.0.

Psidium rufum DC.: *Harley 26373* (ASU), 1–2, 1.4; *Harley et al. 25891* (ASU), 1, 1.0; *Hatschbach 15252* (MICH), 1, 1.0; *Williams 8061* (MO), 4–6, 5.2.

Psidium salutare (Kunth) Berg: *Jansen-Jacobs 87* (ASU), 1–3, 2.2; *Landrum 6521* (ASU), 1–3, 1.6; *Liesner & González 11064* (ASU), 1–3, 1.6; *Zarucchi & Barbosa 3749* (ASU), 1–3, 2.2.

Psidium sartorianum (Berg) Niedenzu: *Landrum 6524* (ASU), 3, 3.0; *Silva 279* (ASU), 3–5, 3.8; *Torres 9811* (ASU), 1–2, 1.2.

Psidium spatulatum Mattos: *Hatschbach 17675* (MICH), 1, 1.0; *Hatschbach 17675* (NY), 1, 1.0.

Psidium striatulum DC.: *Dubs 981* (ASU), 1–2, 1.0; *Ferreira 9638* (ASU), 2–3, 2.4.

Ugni candollei (Barnéoud) Berg: *Gentry et al. 53489* (ASU), 1–3, 1.6; *Landrum 5907* (ASU), 3–5, 4.0; *Landrum 5909* (ASU), 1–3, 2.0.

Ugni molinae Turcz.: *Landrum 5881* (ASU), 0–1, 0.8; *Taylor et al. 10367* (ASU), 0–1, 0.6; *Taylor et al. 10377* (ASU), 0–1, 0.2.

Ugni myricoides (Kunth) Berg: *Davidse et al. 25949* (ASU), 0–2, 1.0; *Landrum 6559* (ASU), 1–3, 1.8; *Liesner 23311* (ASU), 0–1, 0.6; *Méndez 8385* (ASU), 1–4, 2.0; *Tenorio 7498* (ASU), 0–2, 0.4.

OLD WORLD MYRTINAE

Decaspermum alpinum P. Royen: *Conn LAE 69313* (ASU), 1, 1.0.

Decaspermum gracilentum (Hance) Merr. & Pers.: *Kao 7330* (ASU), 1, 1.0.

Myrtus communis L.: *Lehto 16884* (ASU), 3, 3.0; *Lehto 18231* (ASU), 3–7, 5.4; *Poelt s.n.* (ASU), 3–6, 4.8.

Rhodomyrtus tomentosa (Ait.) Hassk.: *Faircloth 1797* (ASU), 5–8, 6.2.

AMERICAN EUGENIINAE

Calycorectes grandifolius Berg: *Prévost 1692* (ASU), 16–21, 18.6.

Calycorectes yatauae McVaugh: *Liesner 16997* (ASU), 1, 1.0.

Eugenia axillaris (Sw.) Willd.: *Glassman 5018* (ASU), 1–2, 1.6.

Eugenia capuli (Schlidl. & Cham.) Berg: *Ventura 30* (ASU), 1, 1.0.

Eugenia farameoides A. Rich.: *Hernández 1316* (ASU), 3–4, 3.4.

Eugenia octopleura Krug & Urban ex Urban: *Haber 758* (ASU), 1, 1.0.

Eugenia oerstediana Berg: *Ventura 8106* (ASU), 0–1, 0.4.

Eugenia pseudopsidium Jacq.: *Prévost 1691* (ASU), 0, 0.0.

Eugenia puniceifolia (Kunth) DC.: *Caballero s.n.* (ASU), 1, 1.0.

Eugenia stipitata McVaugh: *Peters 146* (ASU), 1, 1.0.

Eugenia uniflora L.: *Ortiz 753* (ASU), 0, 0.0.

Myrcianthes mato (Griseb.) McVaugh: *Landrum 5772* (ASU), 1, 1.0.

Myrcianthes pungens (Berg) Legrand: *Hatschbach & Hatschbach 55787* (ASU), 1, 1.0.

Myrcianthes rhopaloides (Kunth) McVaugh: *Solomon 8653* (ASU), 1, 1.0.

Myrciaria cordifolia Legrand: *Cordeiro 344* (ASU), 0, 0.0.

Myrciaria delicatula (DC.) Berg: *Krapovickas & Schinini 38202* (ASU), 0–1, 0.8.

Myrciaria floribunda (West ex Willd.) Berg: *Hatschbach 54928* (ASU), 1, 1.0.

Neomitranthes glomerata (Legrand) Legrand: *Hatschbach 19578* (ASU), 0, 0.0.

AMERICAN MYRCIINAE including the anomalous genus *Luma* that may or may not belong to this subtribe

- Calyptranthes amshoffae* McVaugh: *Larpin* 846 (ASU), 0, 0.0.
Calyptranthes concinna DC.: *Cordeiro* 688 (ASU), 1, 1.0.
Calyptranthes longifolia Berg: *Wallnofer* 11-13788 (ASU), 0, 0.0.
Luma apiculata (DC.) Burret: *Landrum* 5872 (ASU), 0, 0.0.
Luma chequem (Molina) A. Gray: *Gardner et al.* 4427 (ASU), 0, 0.0.
Myrceugenia campestris (DC.) Legrand & Kausel: *Hatschbach* 52288 (ASU), 0, 0.0.
Myrceugenia chrysocarpa (Berg) Kausel: *Gardner* 3503 (ASU), 1, 1.0.
Myrceugenia miersiana (Gardner) Legrand & Kausel: *Kummrow* 2904 (ASU), 1, 1.0.
Myrceugenia myrcioides (Cambess.) Berg: *Silva* 313 (ASU), 1, 1.0.
Myrceugenia obtusa (DC.) Berg: *Landrum* 8214 (ASU), 1, 1.0.
Myrcia calyptranthoides (Berg) Mattos: *Hatschbach* 53588 (ASU), 1, 1.0.
Myrcia citrifolia (Aublet) Urban: *Pirani* 1221 (ASU), 1, 1.0.
Myrcia cuprea (Berg) Kiaerskov: *Mori et al.* 17512 (ASU), 0-1, 0.6.
Myrcia fallax (A. Rich.) DC.: *Sobel et al.* 4580 (ASU), 1, 1.0.
Myrcia guianensis (Aublet) DC.: *Lewis et al.* SPF 36940, CFCR 7140 (ASU), 1, 1.0.
Myrcia saxatilis (Amshoff) McVaugh: *Larpin* 740 (ASU), 1, 1.0.

OLD WORLD LEPTOSPERMAE

- Chamaelaucium uncinatum* Schauer: *Earle* 23 (ASU), 1, 1.0.
Choricarpia leptopetala (F. Muell.) Domin: *Coveny* 15872 (ASU), 1, 1.0.
Metrosideros fulgens Gaertn.: *Weston* 1192 (ASU), 0, 0.0.
Metrosideros polymorpha Gaud.: *Clements* 17 (ASU), 5-8, 6.0.